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AMMUNITION BULLETIN N° 23

FOR INSPECTING ORDNANCE OFFICERS

AND

A.A. AMMUNITION OFFICERS.

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CHIEF INSPECTOR OF ARMAMENTS,
WOOLWICH, S.E. 18.

SECURITY.

AMMUNITION BULLETIN NO.23
for
INSPECTING ORDNANCE OFFICERS
and
A.A. AMMUNITION OFFICES.

Issued by :-

CHIEF INSPECTOR OF ARMAMENTS,
WOOLWICH.

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PACKAGES FOR NAVAL AMMUNITION ISSUED TO LAND SERVICE.

Reference Item 274, Bulletin No.20, the following table gives the nomenclature, stowage dimensions and filled weight of the packages used for this ammunition.

Ammunition	Package	No. held	Stowage Dimensions (Inches)	Approx. Filled Weight (lb.)
B.L. 6-inch Mk.VII gun. Ctge. 23-lb. 2-oz. Cordite S.C.103.	Case, powder, rectangular "T" or Case, powder, rectangular "B"	4 7	33.5 x 13.7 x 13.7 28.4 x 20.6 x 11.3	148 215
B.L. 6-inch Mk.XI gun. Ctge. 33-lb. 12-dr. Cordite S.C.150.	Case, powder, rectangular "T"	4	33.5 x 13.7 x 13.7	188
B.L. 6-inch Mk.XII gun. Ctge. 27-lb. 13-oz. Cordite S.C.122.	Case, powder, rectangular "W"	4	38.9 x 11.9 x 11.9	162
B.L. 5.5-inch Mk.I gun. Ctge. 22-lb. 8-oz. 10-dr. Cordite S.C.155.	Case, powder, rectangular "T"	5	33.5 x 13.7 x 13.7	170
Q.F. 4.7-inch Mk.V Gun. Ctge. 8-lb.10-oz. 6-dr. Cordite S.C.103	Box, Ctge., Q.F. 4.7-inch C.17.	4	29.2 x 14.4 x 13.7	162.5
Shell, H.E. Mk.IA. Shell, C.P., Mk.IIA. Shot, Practice, Mk.VIIIA	} Box, projectile, 4.7-inch P.58.	2	24.1 x 13.2 x 7.7	130
Q.F. 4-inch Mk.IV gun. Ctge. 5-lb. 2-oz. 2-dr. Cordite S.C.103.	Box, Ctge., Q.F. 4-inch, C.22.	6	23 x 17.1 x 13.3	148.5

B.L. 4-inch Mk.IX gun. Ctge. 7-lb. 14-oz. 10-dr. Cordite S.C.103.	Case, powder, rectangular "O".	16	29.2 x 15.1 x 15.1	190
B.L. 4-inch Mk.VII gun. Ctge. 9-lb. 1 $\frac{1}{2}$ -oz. S.C.103.	Case, powder, rectangular "R"	6	20.9 x 13.6 x 9.3	97
Shell, S.A.P. Mk.I. Shell, H.E., Mk.VI or VIII Shell, C.P. Projectile, practice, C.P. weighted.	Box, projectile, 4-inch, P.56.	3	20.5 x 15.4 x 7	130
Q.F. 12-pr. Mk.IIIA gun. Ctge. 2-lb. 1 $\frac{1}{2}$ -oz. Cordite S.C.061.	Box, ctge., Q.F. 12-pr.12-cwt.C.33.	10	20 x 18.3 x 10.6	132
Shell, S.A.P. Mk.I or II Shell, H.E. Mk.IV Shot, practice, Mk.I.	Box, projectile, 12-pr. P.19.	6	16.3 x 14.4 x 10.3	97
Q.F. 3-pr. Hotchkiss gun. Fixed ammunition.	Box, Ammun., Q.F. 3-pr. C.90, C.91 or C.92.	16	22.9 x 14.7 x 12.4	148

The following details are in amplification to those given in Item 274, Bulletin No.20.

(1) H.E. shell. Methods of Filling. (See Item 353.)

Equipment.	Design No. of M. of F.	Bursting Charge.	Depth of Exploder Cavity (Inches)	Fuze	Exploder System	Notes
6-inch & 5.5-inch.	C.I.N.O. 136A.	Lyddite with topping of beeswax composition or of T.N.T.	3.68	18 or 45 44	5 dr. T.N.T. 4 dr. T.N.T. 5 dr. T.N.T.	These designs resemble 20844B (R.A.O.S. Pt. II, Pamphlet No. 1, Plate III).
-do-	N.O.D. 1154.	-do-	3.68	18P or 45P	4½ dr. P.P.	A number of shell fitted with T.N.T. exploders for use with detonating fuzes have retained these exploders when changed over to powder filled fuzes.
-do-	N.O.D. 3499	T.N.T. with topping of beeswax composi- tion.	3.63	18 44 18P or 45P	5 dr. T.N.T. 4 dr. T.N.T. over 5 dr. T.N.T. 4½ dr. P.P.	Shell filled prior to 20/6/30 and which have not since been re- explodered, have a millboard washer and paper washer, instead of tracing cloth discs, on top of the exploder.
4.7-inch, 4-inch & 12-pr.	C.I.N.O. 581	Lyddite with topping of beeswax composi- tion or of T.N.T.	3.68	18P or 45P	4½ dr. P.P.	
3-pr.	17603A(1)	Lyddite with topping of T.N.T. in which exploder cavity is formed. T.N.T. is topped with beeswax composition.	2.26	19P	2¼ dr. T.N.T.	
-do-	23102B.	Lyddite with beeswax composition topping. Exploder cavity may be formed in topping of T.N.T.	2.43	44	2¼ dr. T.N.T.	

(2) Pointed and Piercing Shell Filled H.E. Methods of Filling.

Equipment and Nature of Shell.	Design No. of M. of F.	Bursting Charge.	Depth of Explorer Cavity. (Inches)	Fuze	Exploder System.	Notes.
5.5-inch C.P.C. Mk. V/13A. (Aluminium container)	N.O.D. 3409	T.N.T. with topping of beeswax composition.	4.94	480	1 1/4 oz. T.N.T. Pellet.	
4-inch and 12-pr. S.A.P. (Aluminium container)	C.I.N.O. 755B	Lyddite with topping of beeswax composition.	3.82	12F Special	11 1/2 dr. P.P.	

Pointed Shell Filled Gunpowder. Methods of Filling.

Calibre and Nature.	Design No. of M. of F.	Bursting Charge.	Fuze	Primers	Notes
6-inch C.P.C. (Copper container)	C.I.N.O. 661	P. & F.G. or P.3 & G.20 in bag.	15	G.12 or R.F.G.2. 1 - 14 dr. & 7-dr. A.R.	Similar to 27499.
4.7-inch and 4-inch C.P.	C.I.N.O. 242A.	-do- or Blank L.G.	12F.	1 - 14 dr. & belt primer.	Belt primer is wrapped around fuze and consists of pockets formed in shalloon strip.
3-pr. Steel Shell.	C.I.N.O. 387.	G.20 or Shell F.G. without bag.	Hotchkiss	-	Similar to 12474B. (R.A.O.S. Pt.II, Pamphlet No.1, Plate XXI).

(3) B.L. Cartridges.

Equipment	Arrangement	Igniters	Position of Foil	Dimensions (inches).
6-inch Mk. VII	$\frac{1}{3}$ & $\frac{2}{3}$ charges in S.C. bags laced together.	Two with double igniter covers. *	Inner end of each charge.	25×5.8 $\frac{1}{3}$ (7-lb. $11\frac{1}{3}$ -oz.) 8.5×5.8 $\frac{2}{3}$ (15-lb. $6.2\frac{2}{3}$ -oz) 16.5×5.8 .
6-inch Mk. XI.	$\frac{1}{3}$ & $\frac{2}{3}$ charges in S.C. bags laced together.	Two with 3-ply covers. **	Threaded through cordite at inner end of each charge.	30×6.1 $\frac{1}{3}$ (11-lb. $4\frac{1}{3}$ -dr.) 10.2×5.8 $\frac{2}{3}$ (22-lb. $8\frac{1}{3}$ -dr.) 19.8×5.8 .
6-inch Mk. XII.	$\frac{1}{3}$ & $\frac{2}{3}$ charges in S.C. bags laced together.	Two with double igniter covers or 3-ply covers.	Inner end of each charge.	35.7×5.3 $\frac{1}{3}$ (9-lb. $4\frac{1}{3}$ -oz.) 12.1×5.3 $\frac{2}{3}$ (18-lb. $8.2\frac{2}{3}$ -oz) 23.6×5.3 .
5.5-inch Mk. I.	$\frac{1}{3}$ & $\frac{2}{3}$ charges in S.C. bags laced together.	Two with double igniter covers or 3-ply covers.	Inner end of each charge.	30.5×5.3 $\frac{1}{3}$ (7-lb. $8\frac{1}{3}$ -oz. $3\frac{1}{3}$ -dr.) 10.4×5.3 $\frac{2}{3}$ (15-lb. $6.2\frac{2}{3}$ -dr.) 20.1×5.3 .
4-inch Mk. IX.	Single Charge in S.C. or C.S. bag.	Two with 3-ply covers.	Wrapped round cordite.	23×3.7 .
4-inch Mk. VII.	Single Charge in S.C. or C.S. bag.	Two with 3-ply covers.	Wrapped round cordite.	$17.5 \times 4.4 \times 5$.

* The double igniter cover consists of two silk cloth discs sewn together with a skirting and drawstring to fit over the end of the charge. It is marked "Remove rear cover before firing".

** The 3-ply cover consists of a foil disc secured by an adhesive between an inner disc of undyed silk cloth and an outer disc of red silk cloth. The cover is secured to the ignitor by tacking.

NOTE. - Weights, natures and sizes of propellant are given in Item 350 which enumerates the packages.

352. SECURITY OF VEHICLES CONTAINING EXPLOSIVES.

It is extremely important to ensure, in war time, the highest security arrangements for vehicles containing explosives.

On rail, the rule is to use covered vehicles for all items other than those in Groups V and XIII, which are to be carried in open trucks. In emergency, items in Groups VII, VIII, XI and XII may also be placed in open trucks in that order of preference, with the exception of Grenades and Small Arm in Group XII which should be in covered vehicles. Q.F. Ammunition can be carried in open trucks when urgency exists and no covered vehicles are available.

The security measures available for open trucks are confined to efficient shooting, hence the desirability of limiting their use for explosives.

Covered vehicles containing explosives should be secured by padlocks on both sides. The Railway Companies hold large stocks of these padlocks for this special purpose and loading officers should requisition the padlocks from them. Keys for the padlocks should be held by the Movements Officer at unloading points. When padlocks are not available an effective sealing device is required. Supplies of wire to the design shown on Fig. 126 are being provided together with a suitable wire cutting tool. The method of use is as shown on the Fig.

353. NAVAL AMMUNITION ISSUED TO LAND SERVICE.

1. Shell Markings. (See Item 351)

The following variations in markings, peculiar to Naval ammunition, may be met with on these shell:-

- (a) A green band without stencilling indicates a T.N.T. bursting charge.
- (b) The white distinguishing ring of the Land Service S.A.P. shell is not marked on the Naval types of these calibres.
- (c) The design number of the method of filling is not stencilled on the shell. This can usually be identified by the exploder markings stencilled on the shell.
- (d) The type, (i.e. bag or pellet), weight, nature and lot number of the exploders are stencilled on the shell.
- (e) No system of weight marking is used. The filling designs allow a variation of 1% in the filled weight.
- (f) A T.N.T. topping on a lyddite bursting charge is indicated by the letter "T". This is stamped on the fuze hole bush of H.E. shell and painted on the head of pointed or piercing shell.
- (g) There is no stencilling to indicate the serial number of the filled lot.
- (h) The screwed ring at the base of shell fitted with fuze No.480 is painted blue.

2. Tubes Vent Percussion.

The .4-inch, Mk.IX tube differs from the Mk.VII, already in use in the Land Service, in the filling. The Mk.IX is filled with solid pellets of gunpowder instead of the granular variety.

The .5-inch, Mk.VI differs from the Mk.V, also already in use in the Land Service, in the shear wire of the striker. This is of brass instead of copper.

3. Fuzes.

The fuze No.19A is similar to the No.18 fuze but is smaller in size.

The fuze T. & P. No.93 (Fig.127) has a percussion mechanism similar to that in the No.88 fuze. The detonator for the time mechanism is carried in the upper time ring and supported in transport and storage by a safety pin.

The fuze is graduated from 0-22 and has a time of burning of 48 secs. The lower time ring is filled R.D.202 and in the usual way is lacquered red.

354. BOMB, SPIGOT, MORTAR, H.E. 29 M.M. 20-LB. MARK I.

Reference Item 337, Bulletin No.22. The systems of indicating the nature of bursting charge in this bomb are as follows :-

A yellow band painted around the hind part of the body, stencilled in three places "808" or the whole of the hind part of the body painted yellow and stencilled "808". The monogram of the filling station, the series number of the filled lot and the month and year of filling are also stencilled on the hind part of the body.

The exterior of the assembled cups will not be painted buff colour as stated in the item referred to above; these will be painted service colour.

355. FUZE WASHERS.

Reference Item 182, Bulletin No.16. Owing to manufacturing difficulties the forming of a step on the body instead of using a washer is cancelled.

356. BATCHING BY PROPELLANT LOT. AMMUNITION CONTAINING N.C. POWDERS.

Where ammunition is batched by propellant lot and sub-batched by fuze lot, as with the Q.F. 40 m.m., it will be necessary to depart from the usual procedure when the propellant is an N.C. powder, and the relative quantities in the propellant and fuze lots are such that the sub batch letters normally used will not cope with the resultant number of sub batches. In these circumstances, the batch number will be changed when all of the sub batch letters have been allotted. Thus the same propellant lot will be filled under different batch numbers. The batch numbers will probably be consecutive.

357. FUZE TIME, NO.210, MK.I.
Fig. 128.

This detonating time fuze of the mechanical type is shaped externally to correspond ballistically with the Nos.117, 119 and 231 fuzes and was introduced for use at air-burst ranging.

The time mechanism is similar to that in the No.209 fuze (i.e. "Tavarro" type) whereas the magazine and shutter are similar to those in the fuze No.117.

The maximum time of running is 60 seconds and the vertical slot in the setting indicator cap is graduated accordingly. The step on the centrifugal bolt and the slot in the lower crown are designed to prevent the fuze functioning at settings below $1\frac{1}{4}$ seconds.

Fuze No.222 (See Items 295, Bulletin No.20) will, in time, take the place of this fuze.

358. FUZE, PERCUSSION, DETONATING, 24/31 R.Y.G. MARK I.
Fig.129.

The fuze consists of a brass body carrying an aluminium striker cap which protrudes at the nose. The striker cap is supported by the striker head and retained in position by a stop pin, of brass or steel wire, which passes through the body and elongated holes in the striker cap. The striker head, to which the steel or P.B. striker is attached, is supported by the striker spring, one end of which bears against the underside of the striker head whilst the other bears on a flange on the striker guide. The striker, thus supported by the striker spring, enters the detonator holder which carries a 2 grain fulminate of mercury detonator secured at its inner end by means of a brass washer and detonator plug. The detonator holder is supported on a piano wire raising spring which is compressed between a flange formed on the holder and the brass bush in which the spring is accommodated; the bush being screwed into the inner end of the fuze body. Until the fuze is armed by "Set back", the detonator holder is prevented from rising by means of the arming piece which is positioned under the striker guide. The arming piece consists of a brass ring with six arms or extensions protruding from the underside. These arms have projections formed at the inner end which enter a groove formed near the head of the detonator holder and bearing against the inner face of the groove prevent the holder being raised by the raising spring. The arming piece is supported by the arming sleeve which surrounds the arms and is itself supported by the arming spring. The arming spring is of piano wire and is held between the flange on the detonator holder and an internal flange formed in the arming sleeve. The detonator assembly is carried in the brass magazine case which is screwed into the inner end of the fuze against a boxcloth washer and secured by a set screw. This assembly consists of a copper outer shell which conforms to the shape of the interior of the magazine case and an inner shell, also of copper, which is positioned within the outer shell, over a 34.5 grain filling of fulminate of mercury. The inner shell has a central perforation in its base and is secured by a cannellure. The fulminate of mercury filling in the outer shell is covered by a linen disc over which two boxcloth washers are placed. A disc of lead tin-foil is fitted under the perforation in the inner shell. The striker cap is waterproofed with R.D.1160 or R.D.1154.

Action.

On acceleration the set back of the arming piece and sleeve overcome the support of the arming spring and the arming piece ceases to bear against the rear face of the striker guide. In the course of this movement the projections on the arms of the arming piece move out of the forward groove in the detonator holder and are engaged by the rear groove. The arming piece is thus prevented from returning

to the forward position. The displacement of the arming piece and sleeve permits the raising spring to move the detonator holder forward and brings the detonator within the reach of the striker. On impact the striker cap is driven in and causes the striker to pierce the detonation which is carried forward. The resultant detonation brings about the detonation of the fulminate of mercury in the magazine.

359. FUZE, POINT, DETONATING, M.46.
Fig.130.

The brass body of the fuze has a central flash channel masked by a spring loaded interrupter. The head assembly includes an aluminium alloy firing pin supported by a cylinder of gilding metal in a recess formed at the nose. The recess is closed to atmospheric pressure by an aluminium disc.

The detonator situated below the firing pin consists of an aluminium cup containing 3.1 grains of lead azide topped by 1 grain of "Primer mixture". A central perforation in the front of the cup is closed by an aluminium disc. The base end is closed by the retainer, a cup shaped device of aluminium alloy.

The lower detonator assembly which is, in effect, the magazine is carried in a brass socket which is screwed to the base end of the body. This assembly consists of an aluminium casing shaped to fit the socket and containing 24.7 grains of C.E. topped by 20.06 grains of lead azide. A disc of cotton sheeting and a felt washer are situated above the lead azide and the mouth of the casing is closed by the retainer. The retainer is a cup shaped aluminium device with a hole in its base closed by a disc of aluminium foil.

Action.

The interrupter is designed to arm by centrifugal force at 1800 revolutions per minute. On impact the firing pin crushes the supporting cylinder and pierces the detonator. The flash produced passes through the flash channel and brings about the detonation of the C.E. by means of the lead azide.

The composition of "Primer mixture" is as follows :-

Potassium chlorate	33.4%
Antimony sulphide	33.3
Lead Azide.	28.3
Carborundum	5
	<u>100.0</u>

The approximate weight of the fuze is given as .72 lb. and its overall length is 5.66 inches. The distance between the flange of the body and the head is 3.01 inches.

360. SHELL OR BOMBS FILLED H.E. SIMPLIFICATIONS TO FACILITATE PRODUCTION.

The use of a paper tube without a bottom for the exploder cavity is approved when there is a complete T.N.T. surround (i.e. bottom and sides) except in cases where a metal smoke box is employed.

The use of paper tubes not treated with wax or varnish is approved for Lyddite, T.N.T. or T.N.T./B.W.X. fillings but not for Anatol.

The use of bag exploders in substitution of the pellet type may be authorised in some cases except in A.P. shell.

The stencilling of the letters T.N.T. below the green band instead of on the band of shell so filled has been approved.

361. CONVEYANCE OF EXPLOSIVES.

1. The movement of explosives by road, rail, river, canal and sea, (within territorial waters) in Great Britain, the loading of explosives into ships in British home ports and the unloading of explosives from British ships in home ports is effected under the terms of the Explosives Acts 1875 and 1923.

2. These Acts do not specifically deal with the details of such conveyance but they provide for byelaws being drawn up by transport and harbour authorities for explosives traffic. When approved by the appropriate minister (at present the Minister for War Transport) such bye laws are statutory. The railway companies bye laws on the subject are important and are to be found in their "Orange Pamphlet". They are also exhibited on posters at all railway stations. Road regulations have been issued in the form of an order by the Secretary of State No.11 dated 1924. Harbour byelaws have been approved for practically all the harbours in Great Britain and copies can be obtained from each authority. These latter are mainly of local interest. The actual loading of ships with explosives in British ports is covered by the Regulations for His Majesty's Sea Transport Service, so far as freight ships are concerned whilst ammunition ships and troopships are dealt with specially by instructions as a purely war time measure outside the Regulations.

3. The conveyance of explosives in peace is conducted under the bye-laws, rules and regulations referred to in para.2 and they apply equally to service and trade consignments. As is to be expected, they are somewhat restrictive. On rail, explosives can be conveyed by goods trains only. Five vehicles containing explosives may be on one train and the explosive limit is 10,000 lb. nett explosive for a covered vehicle or 2,240 lb. nett for an open vehicle. On road, the limits per vehicle are 4,000 lb. gross for a gunpowder van and 2,000 lb. gross for any other road vehicle. The shipping limits are not defined but are determined by the Ministry concerned.

4. Under Section 97(5) of the Explosives Act 1875, Government Explosives are excluded from the operation of the Act and therefore from the bye-laws rules and regulations referred to in paras.2 and 3, provided such explosives are accompanied throughout by an official, known as a conductor, appointed by the Secretary of State or Head of the Department owning the consignment. The conductor can be dispensed with and the limits in para.3 exceeded provided the consignment is made under regulations approved and signed by the Head of the Department.

5. For many years the procedure adopted was not strictly in accordance with this legal rule but steps have now been taken to place the procedure on a more substantial basis. Regulations for the Conveyance of Government Explosives by the railway companies have been drawn up and are now to be published. These are similar for each service department, except for references to forms and publications in the text which differ for each service. Each service must approve, sign and publish the Regulations separately as the Explosives Act 1875 only permits of this being done by each service for its own explosives. These Regulations are divided into two main parts dealing with "Normal Traffic" and "Special Traffic". "Normal Traffic" is in strict accordance with the Railway Company's bye-laws and is therefore common practice. "Special Traffic" provides for larger consignments per train and per vehicle but introduces certain restrictions as to the types of explosive to be on such augmented trains. Briefly up to 36 vehicles containing explosives can be on one train and 4,000 lb. nett explosive can be in an open vehicle.

368. TUBES. METHODS OF FILLING.

The use of gunpowder G.7 has been approved as an alternative to solid pellets of gunpowder for the filling of :-

- Tubes, vent, percussion, .4-inch and .5-inch.
- Tubes, vent, electric, .4-inch and .5-inch.
- Tubes, percussion, small arm, cartridge.

369. SHELL. B.L. C.P.B.C. 6-INCH. REPAIR OF BROKEN FILLINGS OF T.N.T./B.W.X.

Reference R.A.O.S. Part II, Pamphlet No.1, Appendix VII.

The local repair of broken fillings of B.L. 6-inch C.P.B.C. shell filled T.N.T./B.W.X. and fuze No.480 is approved for a depth not exceeding .75-inch. The procedure to be as follows :-

- (a) Remove the exploder and paper tube.
- (b) Remove any dusty explosive.
- (c) Treat the broken cavity with the minimum quantity of composition to bring it to the right diameter, leaving a small space at the base of the fuze threads to house the slit ends of the paper tube.
- (d) Insert a new tube and proceed normally, treating the exposed surface of the composition beeswax with shellac varnish.

370. GRUMMETS. SHELL. USE OF MANILLA ROPE.

Manilla rope is now being used in some cases for the making of grummets. This type of rope is more liable to stretch than the hemp normally used for this purpose, it will therefore be necessary to examine and, when necessary, tighten these grummets.

371. ROCKET. U. 5-INCH. PACKING OF PRESSURE PLATE PLUGS.

Reference Bulletin No.22, Item 324, page 3.

The information regarding the packing of pressure plate plugs given under the heading "Packing. Details, weights and dimensions" is cancelled and the following substituted :-

- (a) Tails propelling Mk.I, which will be relegated to practice, are packed in box M.107. The pressure plate plugs are included in this box.
- (b) Tails propelling Mks.II and III, which are for operational use, may be packed in boxes M.107 or M.118. The pressure plate plugs are not included in the boxes with these tails but are included in the box containing the bombs.

The differences between the tails propelling are as follows :-

The Mark II differs from the Mk.I in the diameter of the screw-threads for the attachment of the pressure plate and venturi. These are reduced in diameter and the length of the threaded portion in the outer tube is reduced.

The Mk.III differs from the Mk.II in the design of the pressure plate. This plate which is of cast iron is thicker and is strengthened by six ribs.

372. ROCKETS U. MARKINGS ON TAILS PROPELLING.

The following particulars will in future be included in the stencilling on 3-inch and 5-inch tails :-

- (a) Letters and number identifying the igniter composition (e.g. S.R.371.C.)
- (b) Lot number of igniter composition.
- (c) Year of manufacture of the igniter.

These particulars will be stencilled below the temperature marking on the 3-inch tail and below the date of filling on the 5-inch tail.

373. GRENADE, HAND, NO.75, ANTI-TANK MK.I.
Fig.132.

The grenade consists of a tinned plate body containing an H.E. bursting charge and carrying two detonators in holders formed on the exterior. A striker in the form of a strip is carried on a plate which is also fitted to the exterior of the body adjacent to the detonator holders. The detonator holders are cut away to permit the functioning of the striker when sufficient pressure is brought to bear upon the striker plate or the body.

The tinned plate body with a standard one pint capacity has a short neck, approximately one inch in diameter, which is closed by a screw cap. The interior of the body is coated with an approved lacquer.

The detonator holders are made from tinned plate bent to form two pockets and soldered to the body.

The striker plate, to which the striker is welded, is secured to the body by means of brackets at each end of the body. These brackets are soldered to the body. The striker plate is secured to the brackets by bent over tabs.

The following fillings may be used :-

- (a) Nobels explosive No.704B.
- (b) Nobels explosive No.704B and 4 exploders.
- (c) Military Ammonal and 4 exploders.

The exploders, when used, are positioned at the base end of the body and consist of Nobels Victor Powder in waxed paper wrappings 3-inches in length and $\frac{7}{8}$ -inch in diameter.

The estimated weight filled is 1-lb. 8-oz.

Markings.

The presence of the H.E. filling is indicated by the buff coloured body and the red ring around the neck.

When filled ammonal the screw cap is painted pink. When 704B is used this is stencilled on the cap and if the exploders are included the cap is stencilled "704B and 4 EXPRS."

The following details are stencilled on the body in black :-

Recognised mark of the filling station.
Month and year of filling.
Lot Number.

Packages and Dimensions.

12 grenades are packed in the steel box No.G,20 which includes a hinged box-like tray of wood containing 24 detonators. The box,G,20, except for internal fittings is similar to box No,P.59. The approximate stowage dimensions are 19.2 x 8.4 x 7.9-inches. The weight of the box when empty is 10-lb. 3-ozs. and the estimated filled weight is 30-lb.

Detonators.

The detonators to be used with this grenade have not yet been approved. The commercial A.S.A. No.8 with Bickford igniter will probably be used.

374. GRENAD, HAND, ANTI-TANK, TYPE S.T. - NOMENCLATURE.

The abovementioned grenade will be known in future as "Grenade, Hand, No.74, Anti-Tank, Mk.I."

A description of this store is given in Item 184, Bulletin No.16.

375. STATION MONOGRAMS.

Reference Magazine Regulations Part 1, 1934, Appendix III. The following additions are notified :-

L.	Accra	A.A.
L.	Burghfield	B.F.D.
L.	Hirwain.	H.N.
L.	Kidderminster.	K.R.
L.	Kincardine	K.F.
L.	Nesscliff	N.F.
A.	North of Ireland.	N.I.
L.	Rainford	R.D.
L.	Bourneville	B.V.E.
N.	Lake Timsah	L.T.H.
N.	Greenock	G.K.

ENEMY AMMUNITION.

376. GERMAN CARTRIDGE, Q.F., A.P., 28/20 M.M. MODEL 41.
Fig. 133.

This fixed Q.F. round is fired from the high velocity anti-tank gun of the coned bore type.

The brass cartridge case which is necked and fitted with a blued steel primer of the normal German design contains a 2347.5 grain propellant charge of graphited N.C.T. The propellant is .051 inches in diameter and in lengths of .086 inches.

The primer is lubricated with a brown non-drying grease.

The projectile consists of an armour piercing steel core fitted with a lead sheath in rear of the ogive. The core is contained in an iron alloy sleeve at the forward end of which is formed a flange which slopes towards the base and has five equi-distant holes in it. A cup, with a similar flange formed around its base, is fitted over the rear end of the sleeve and core. The holes in the forward flange are probably intended to allow air to escape from between the flanges when these are crushed in passing through the tapered bore. A hollow ballistic cap is fitted to the forward end of the sleeve. This cap is probably of magnesium alloy.

The flanges of the projectile are a close fit in the neck of the cartridge case where the projectile is secured by the mouth of the case being lightly spun over the forward flange. The joint is painted red. The mouth of the case is also lightly indented into the rear flange at four points.

It has been observed that this projectile produces a flash on impact.

Weights and Dimensions.

Cartridge. Length 22 c.m., Weight 9754.4 grains.

Case. Length 18.75 c.m., Diameter at mouth 3 c.m.,
Diameter at rim 4.8 c.m.

Projectile. Weight 2030 grains. Length overall 6.42 c.m.

Core. Weight 759.6 grains. Length 4.07 c.m.
Diameter 1.09 c.m.

377. GERMAN BASE FUZE.
Fig. 135.

This is a graze fuze of the igniferous type.

The brass inertia pellet (11) containing an igniferous detonator (9) is closed by the screwed plug (11A). In the unarmed position the inertia pellet is prevented from moving forward on to the steel needle (5) by the five centrifugal segments (6) which intervene between the base of the screwed plug (2) and the top of the inertia pellet. The segments are pivoted on the brass pin (6A) and are prevented from turning outwards by the brass sleeve (7). The sleeve is held in position by the two spring fingers (8A) on the collar (8).

Action.

On acceleration, the sleeve (7) sets back and is held in position by the engagement of the spring fingers (8A) with the step (7A) in the sleeve (7). The segments are now free to open out under the action of centrifugal force. There is no creep spring. The inertia pellet, therefore, carries the detonator lightly against the needle during flight. The detonator is closed by a copper disc which is as thick (0.004") as that used in the 3 grain "A" detonator, of the British base fuze.

On impact the flash from the igniferous detonator passes through the flash hole (3A) and enters the delay unit (3). After passing along transversely drilled channels, forming a labyrinth, it leaves via the hole (3B) and enters the pressed gunpowder pellet (4A). The flash from the delay passes through two flash holes (4B) and is picked up by a small amount of loose grain gunpowder (14) which communicates the flash to the pressed gunpowder pellet in the magazine (13).

The delay is obtained by the burning of the pressed gunpowder (4A) and probably to a certain extent by the labyrinth in the delay unit (3).

The general arrangement of the inertia pellet, arm mechanism, and delay unit is similar to that in other German base fuzes, previously examined, although in these fuzes the hole corresponding to (3B) had been drilled or blown through, thus bye-passing the labyrinth in the delay unit (3).

The most likely cause of blind with this type of fuze would be the failure of one or more of the centrifugal segments to swing completely out of their safe position. Even a slight overlap of one segment would prevent the inertia pellet from moving forward on impact.

376. GERMAN CARTRIDGE Q.F., A.P., ANTI-TANK, 37 M.M.
Fig. 134.

The projectile of this fixed Q.F. round consists of a 15 m.m. A.P. hardened steel core fitted inside a cylindrical body which is fitted with a conical ballistic cap and provided with a tracer filling.

The body has a front and rear flange formed on it. The forward side of the front flange is sloped to conform with the ballistic cap which is screwed into it. The rear flange has a circumferential groove which, in conjunction with a step formed on the front flange, apparently is used for the attachment of the projectile to the case on assembly. A tracer cavity, closed by a celluloid disc, is formed in the base of the body.

The ballistic cap is of light alloy and contains a pressed paper tip.

The body is of free cutting mild steel with a higher sulphur content and the weight of the complete projectile is 5500 grains.

The cartridge case is rimmed and made of steel, coated on both sides with brass, and contains a propellant in the form of dark green tubes of the following dimensions: length 18.45 cms., external diameter 2.5 m.m., internal diameter 1.15 m.m. The approximate composition of the propellant is :-

Nitrocellulose	58%
Ethyl centralite	2.5
Ash	.5
Nitroglycerine	39
	<u>100</u>

The case also contains an igniter in the form of a silk bag containing chopped cylinders of ungraphited nitrocellulose powder stabilized with diphenylamine. The chopped cylinders are approximately 1.15 mm. in length and .95 mm. in diameter. The weight of the igniter filling is 1.83 grammes.

379. AMENDMENTS.

Bulletin No.20, Item 277, Page 8 :-

Amend the weight of the 1-inch Aiming Rifle Cartridge to read "13-oz. 5-dr."

Bulletin No.22, Page 12, Item headed "Bomb, Spigot, Mortar, H.E., 29-M.M. 20-lb., Mark I":-

Amend the Item No. to read "337"

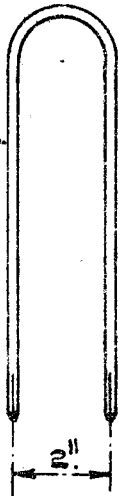
Page 13, lines 19 and 20 :-

Delete the sentence commencing with "The exterior" and substitute, "(See Item 354, Bulletin No.23)".

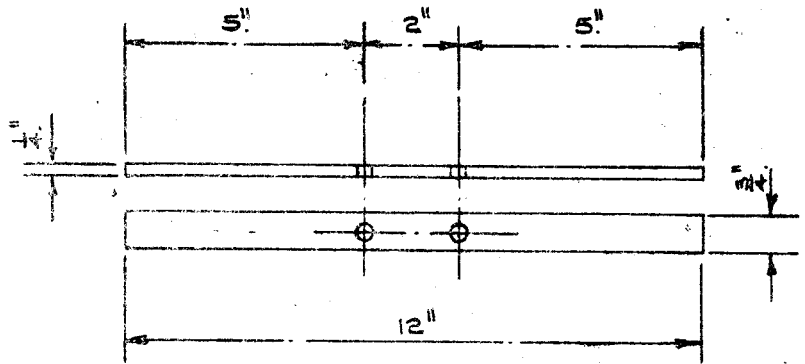
FIG. 12G.

PLAN N° 55
I.P.C/D.O
H.J.L 16-8-41.

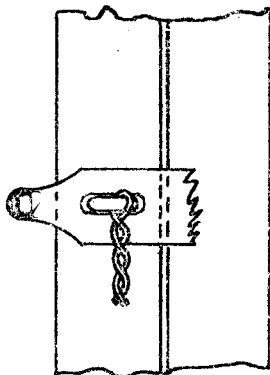
18 inches of $\frac{1}{4}$ " steel
mild round black
B.S.S. 5005/201.



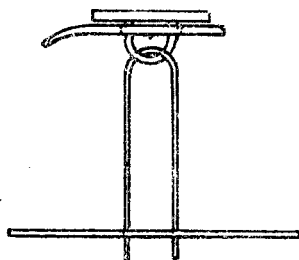
SEAL



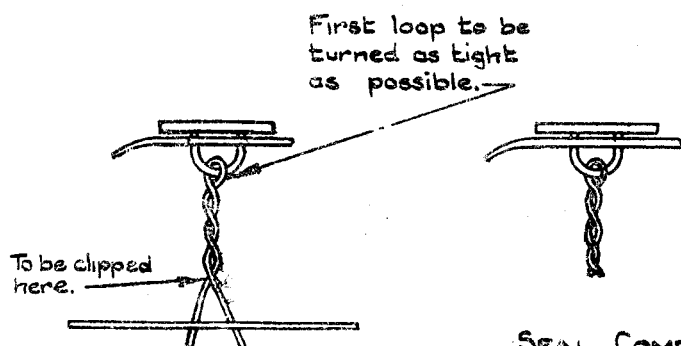
SEALING TOOL.



ELEVATION
SEAL IN POSITION ON
WAGON.



SEAL AND SEALING
TOOL BEFORE TURNING.



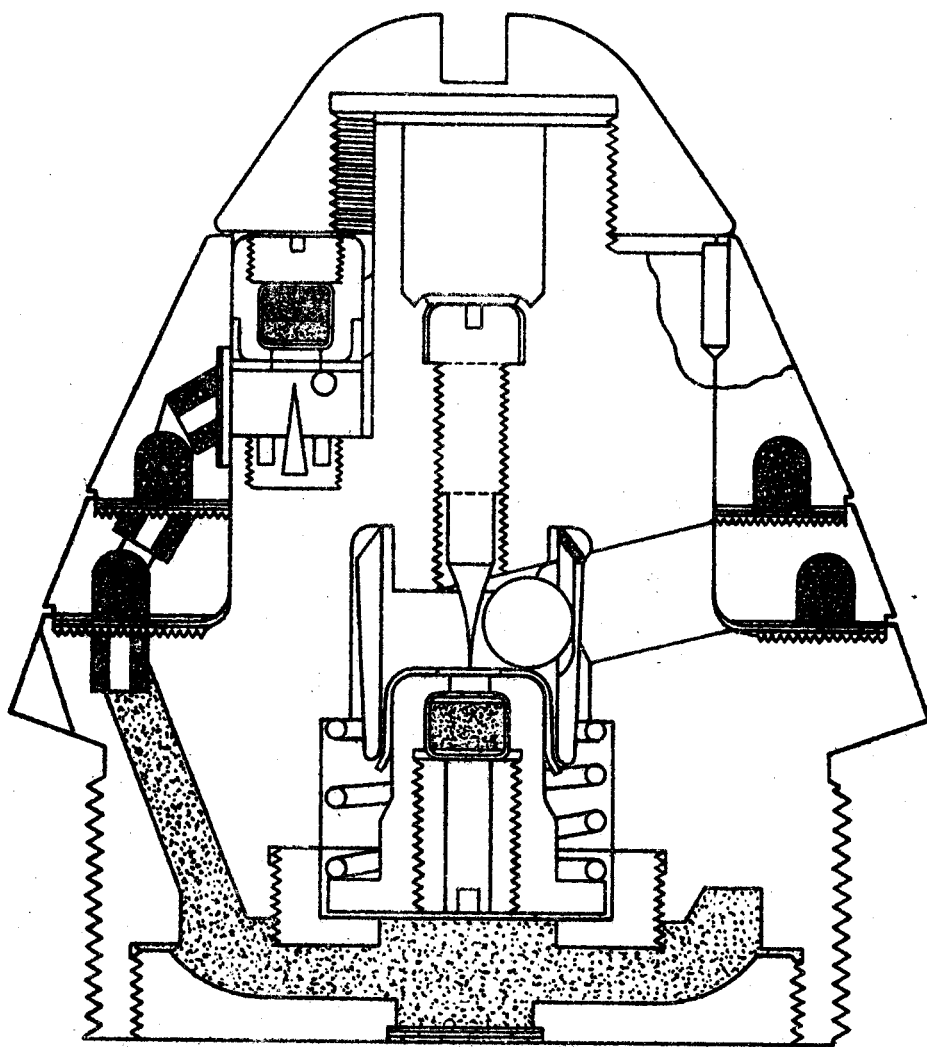
SEAL AND SEALING
TOOL AFTER TURNING.

SEAL COMPLETED.

—SEALING OF RAILWAY VEHICLES CONTAINING—
—EXPLOSIVES.—

ALTERNATIVE SEALING ARRANGEMENT

FIG. 127.
FUZE, T & P, N° 93, MK I.



TOP RING WITH DETONATOR AND SAFETY PIN.

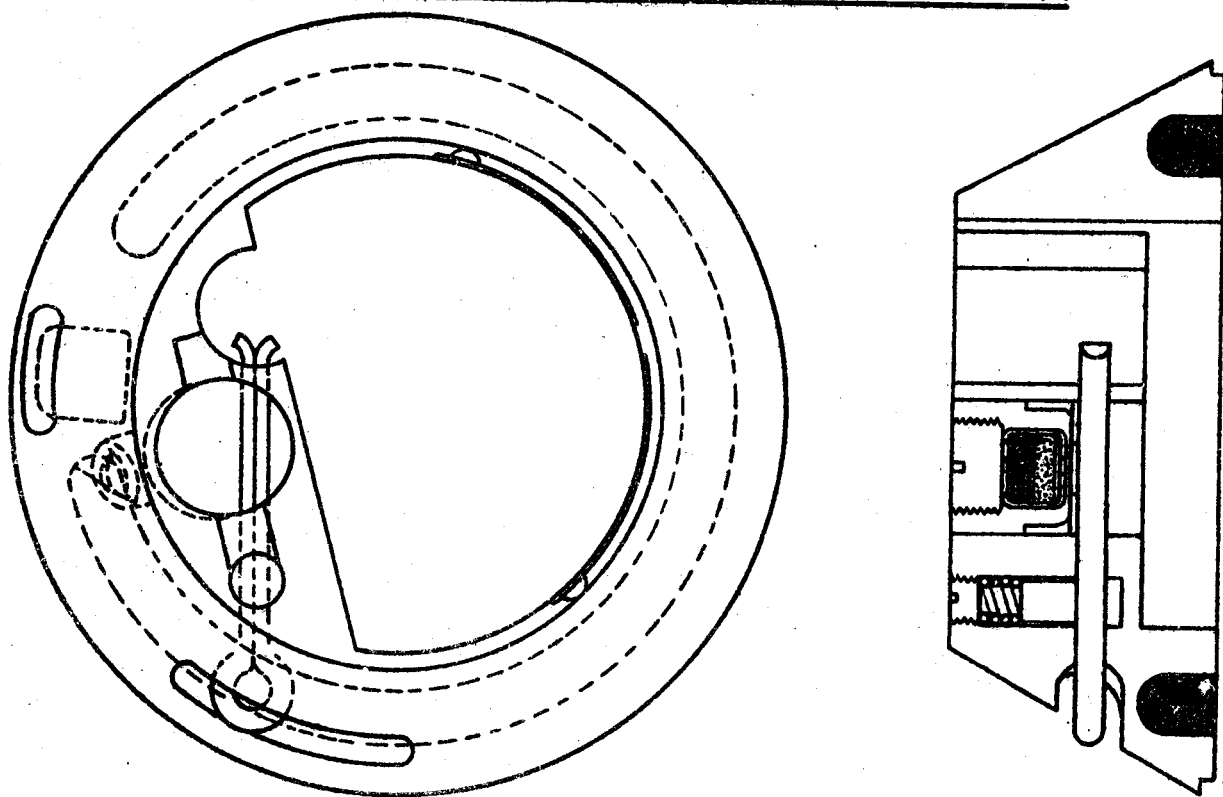
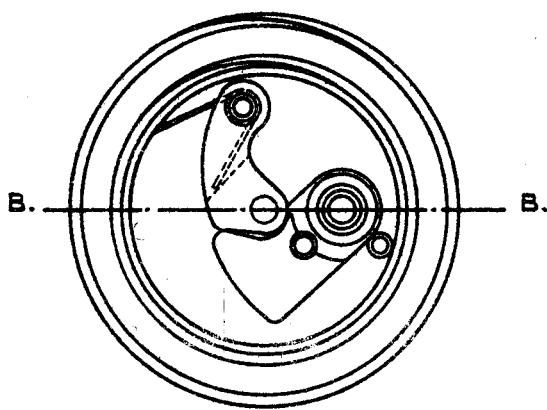
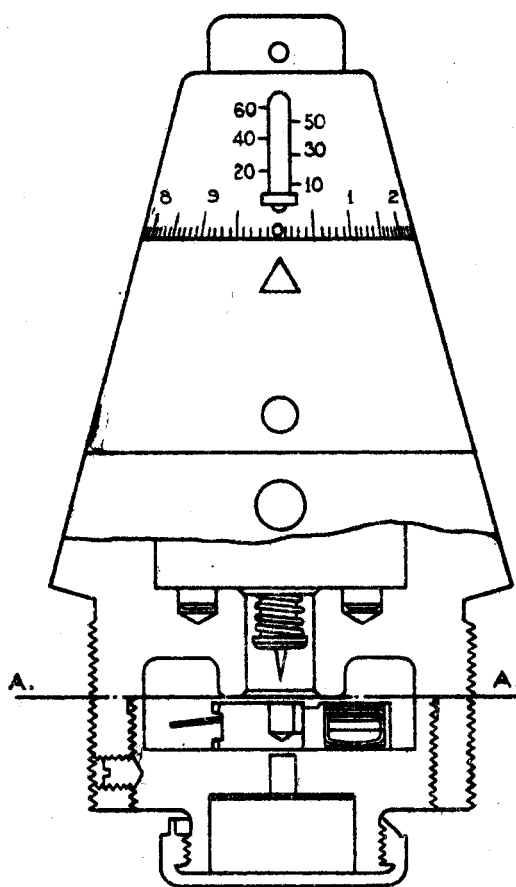


FIG .128.
FUZE , TIME , N° 210. MK. I.



SECTION .A.A.



SECTION . B.B.

FIG. 129.

FUZE, PERCUSSION, DETONATING, 24/31 R.Y.G. MK.I.

Scale $\frac{2}{1}$

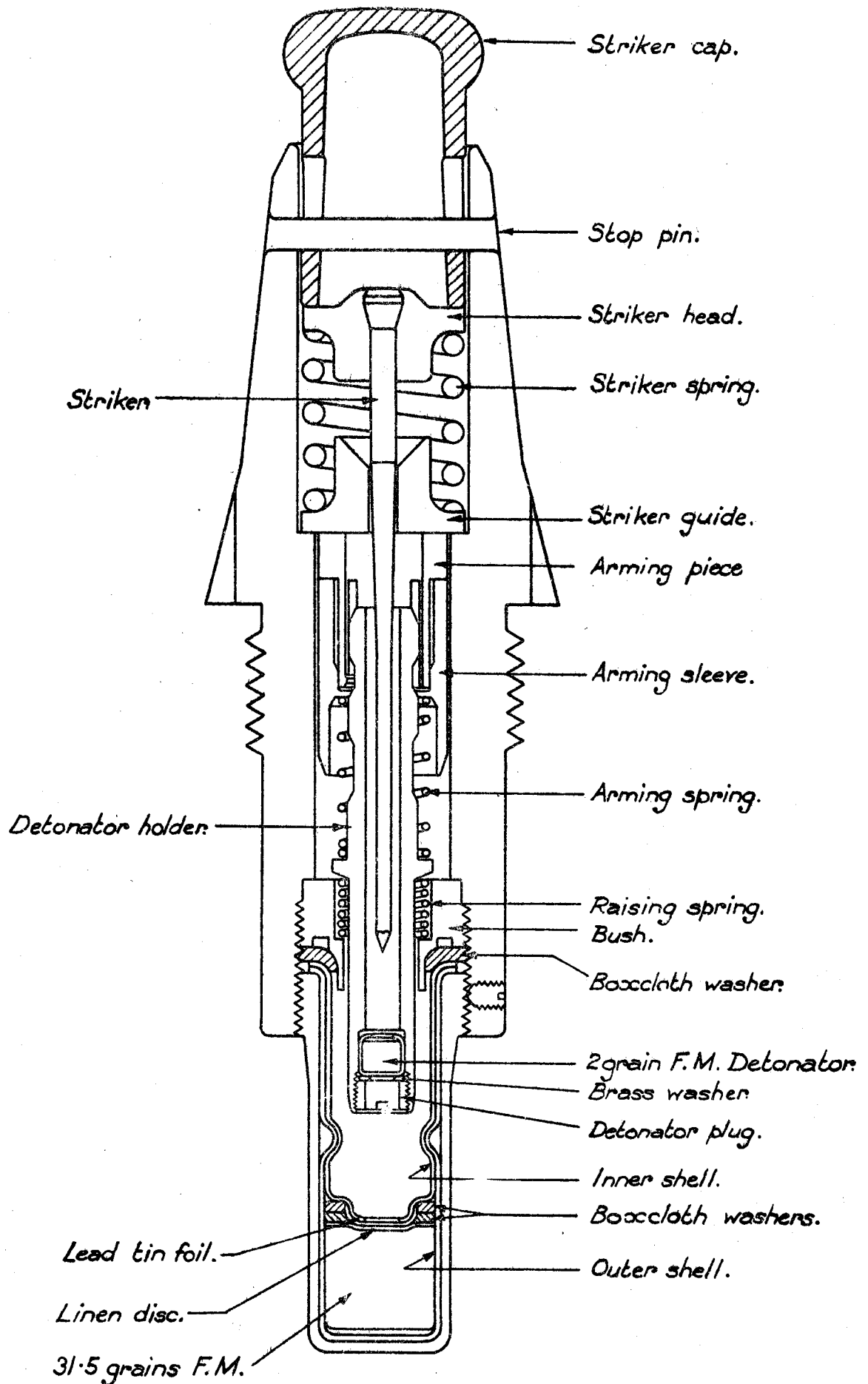


FIG. 130.
FUZE, POINT, DETONATING, M 46.

Scale 2/1.

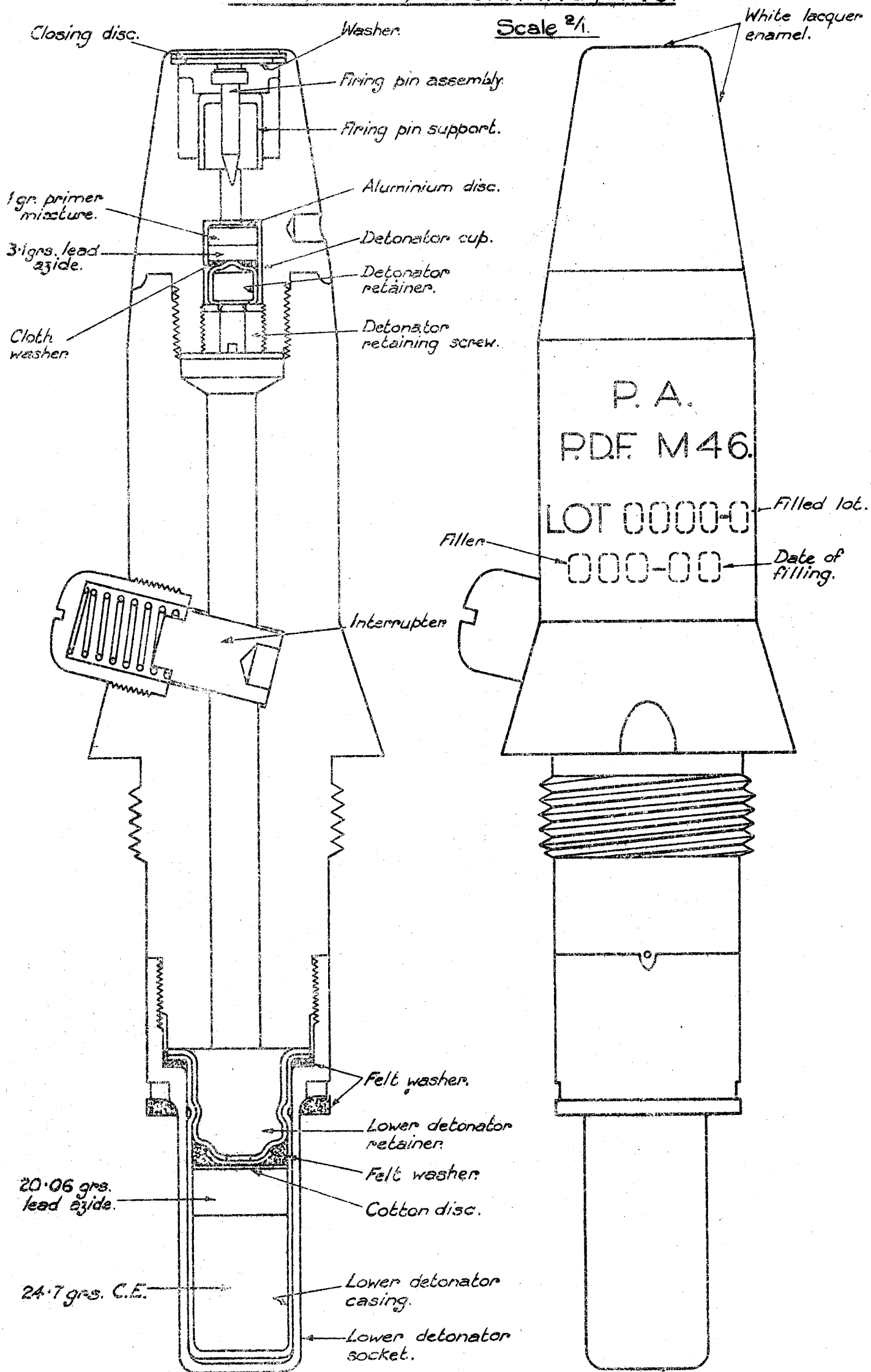
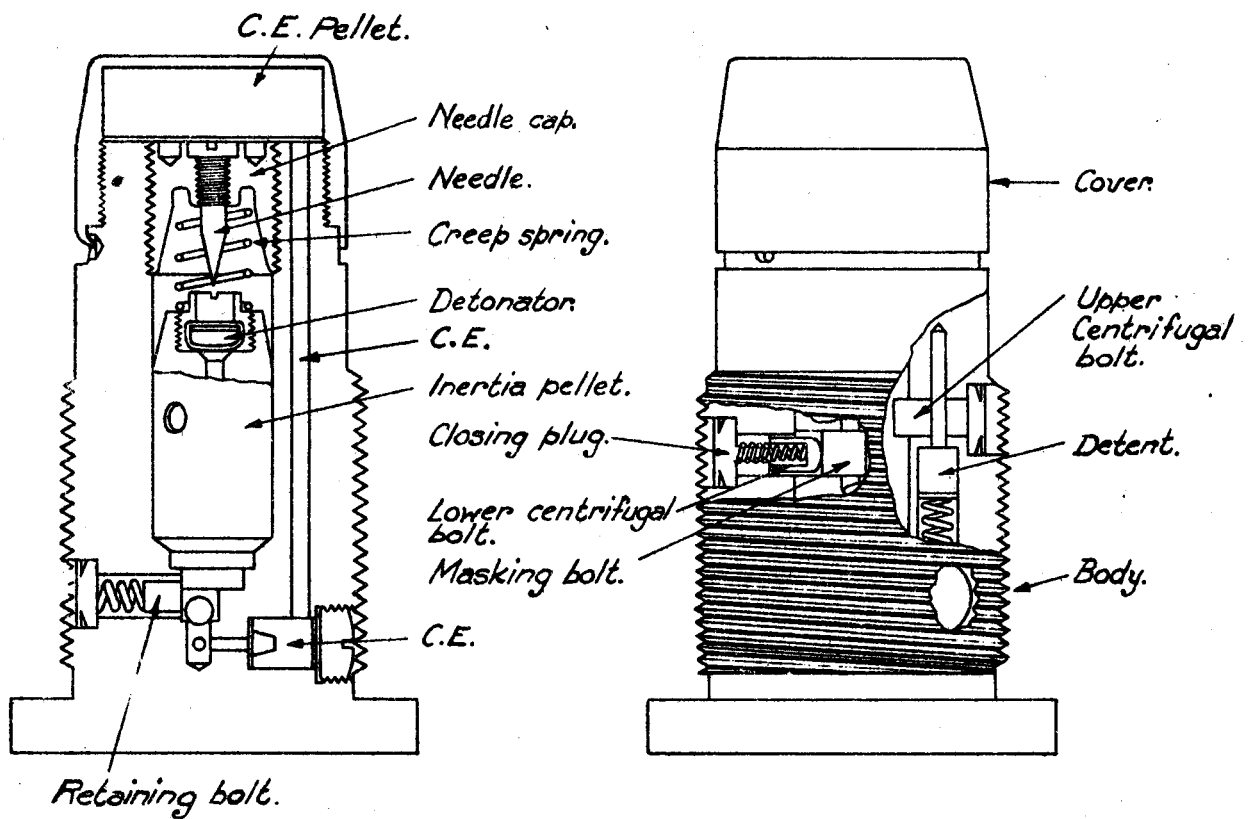


FIG. 131.
FUZE N° 500.



FUZE N° 501.

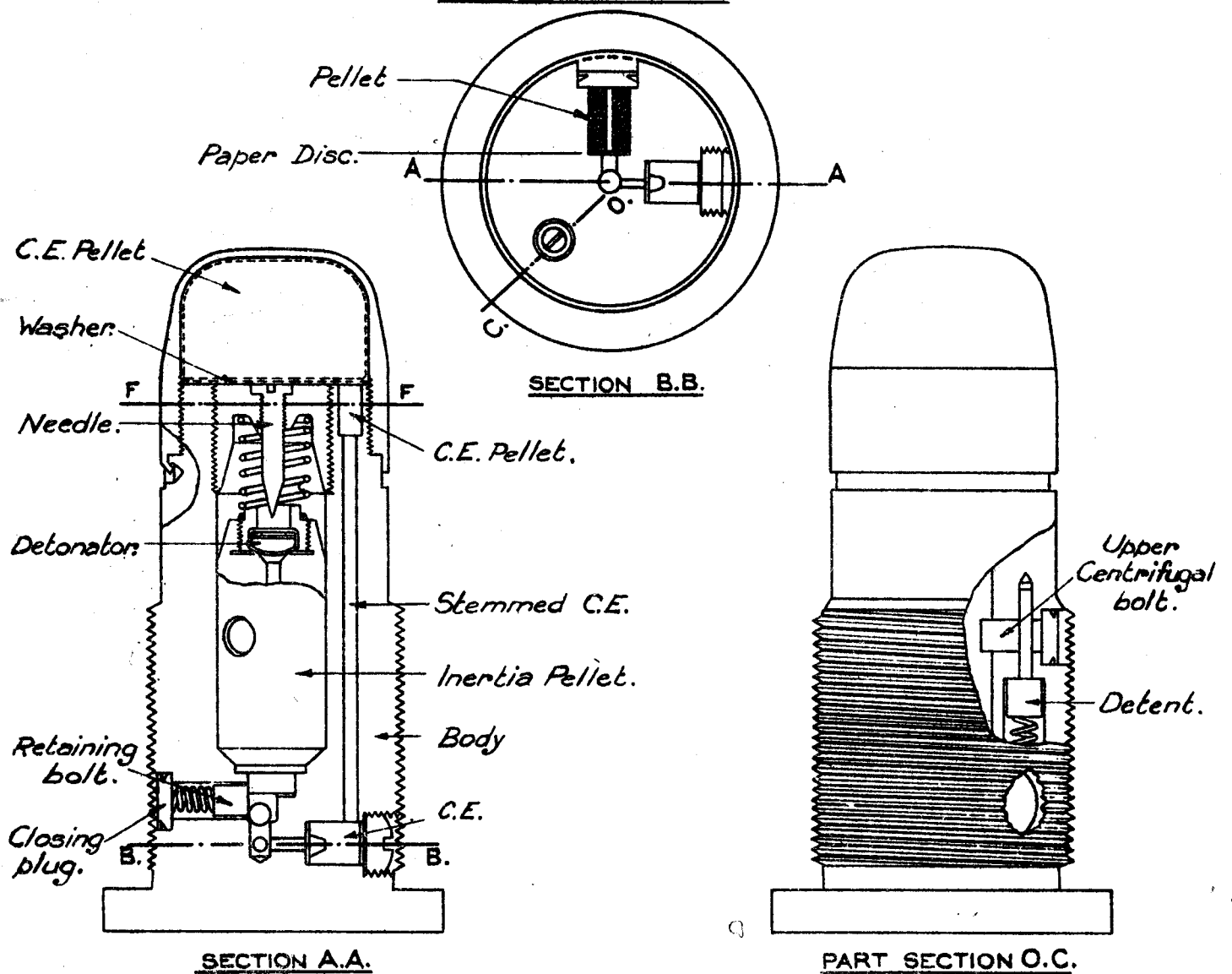


FIG. 132.
GRENADE, HAND, N° 75, A.T. MK. I.

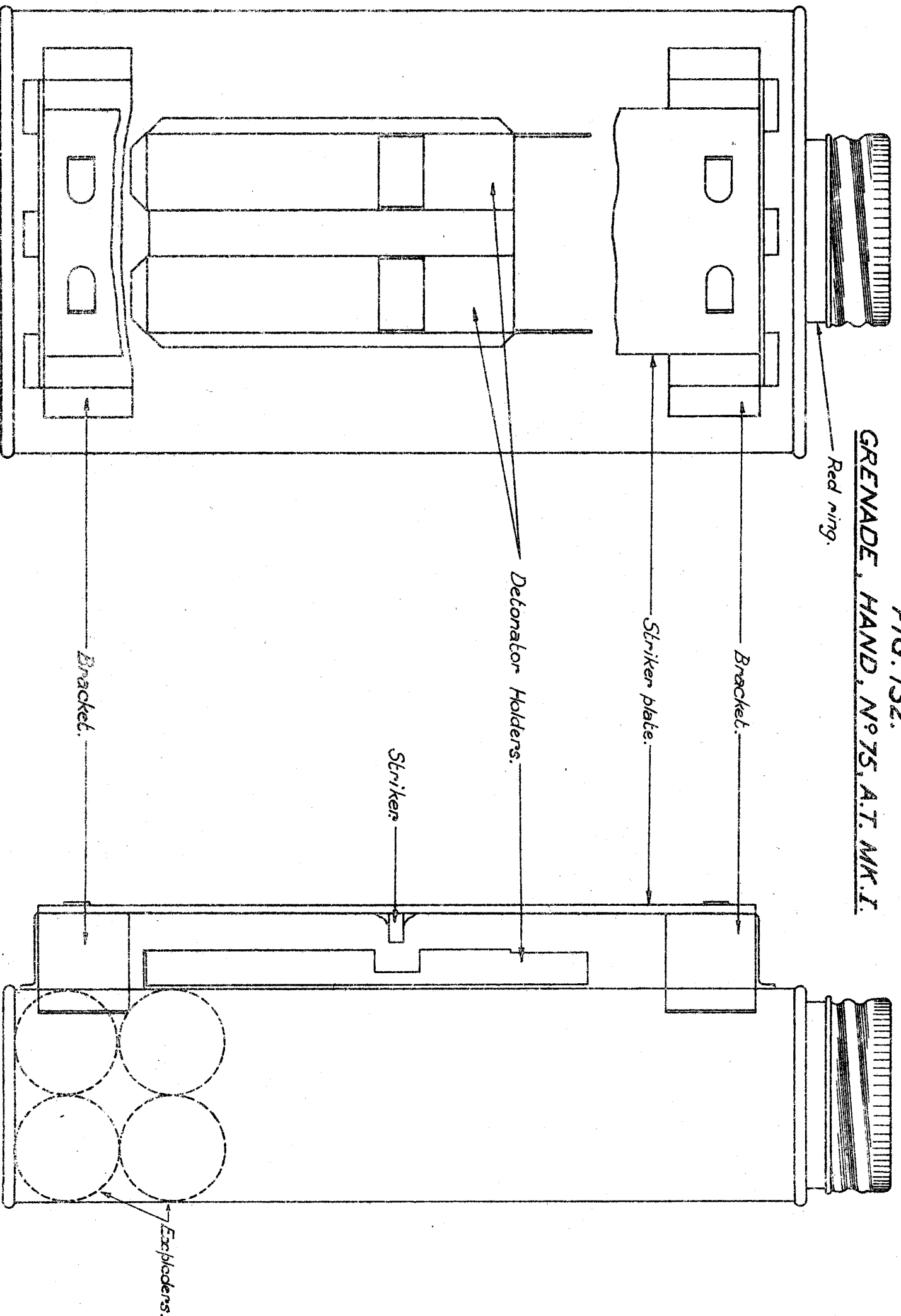


FIG. 133.
GERMAN, CARTRIDGE, Q.F., A.P., 28/20 M.M. MODEL 41.

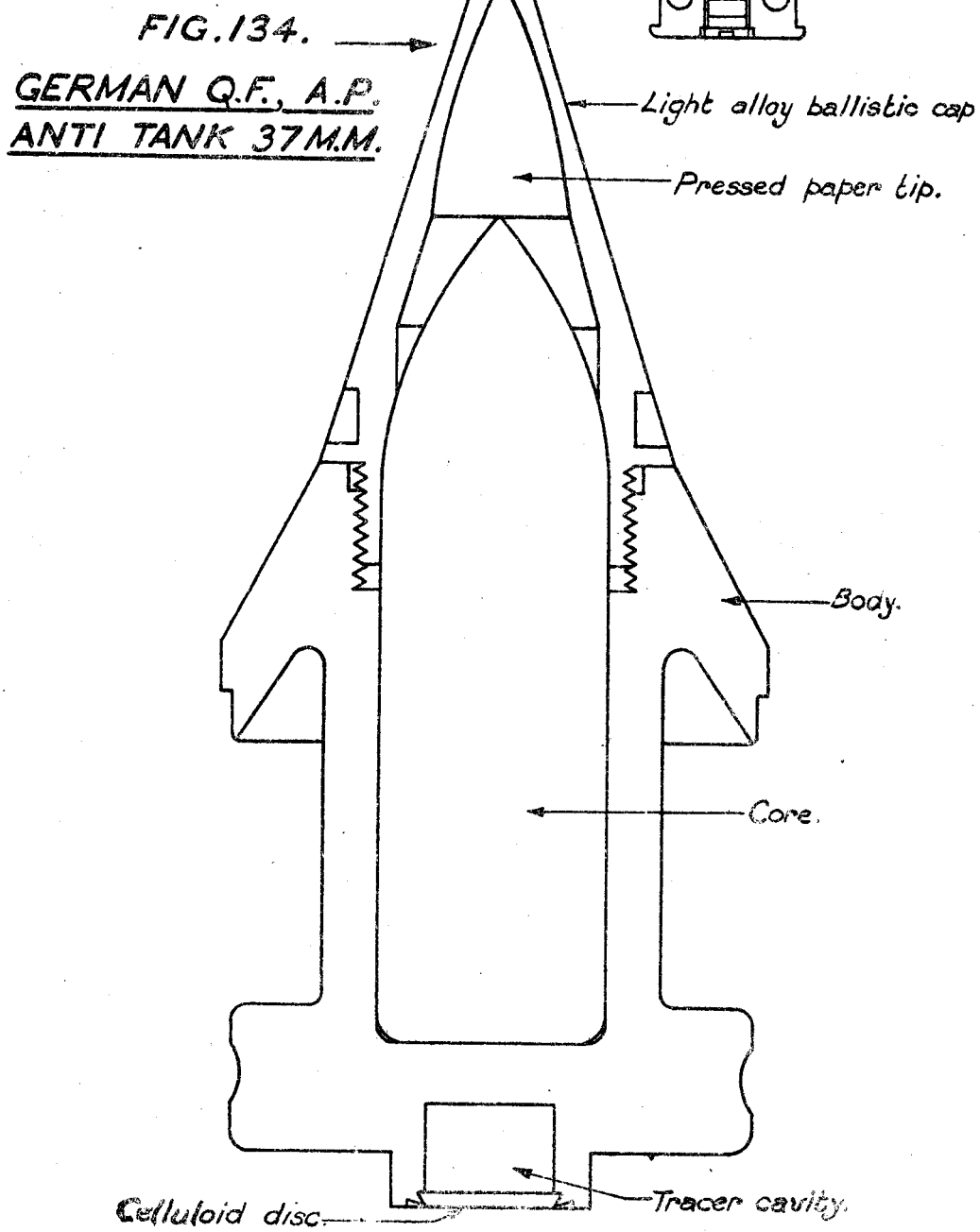
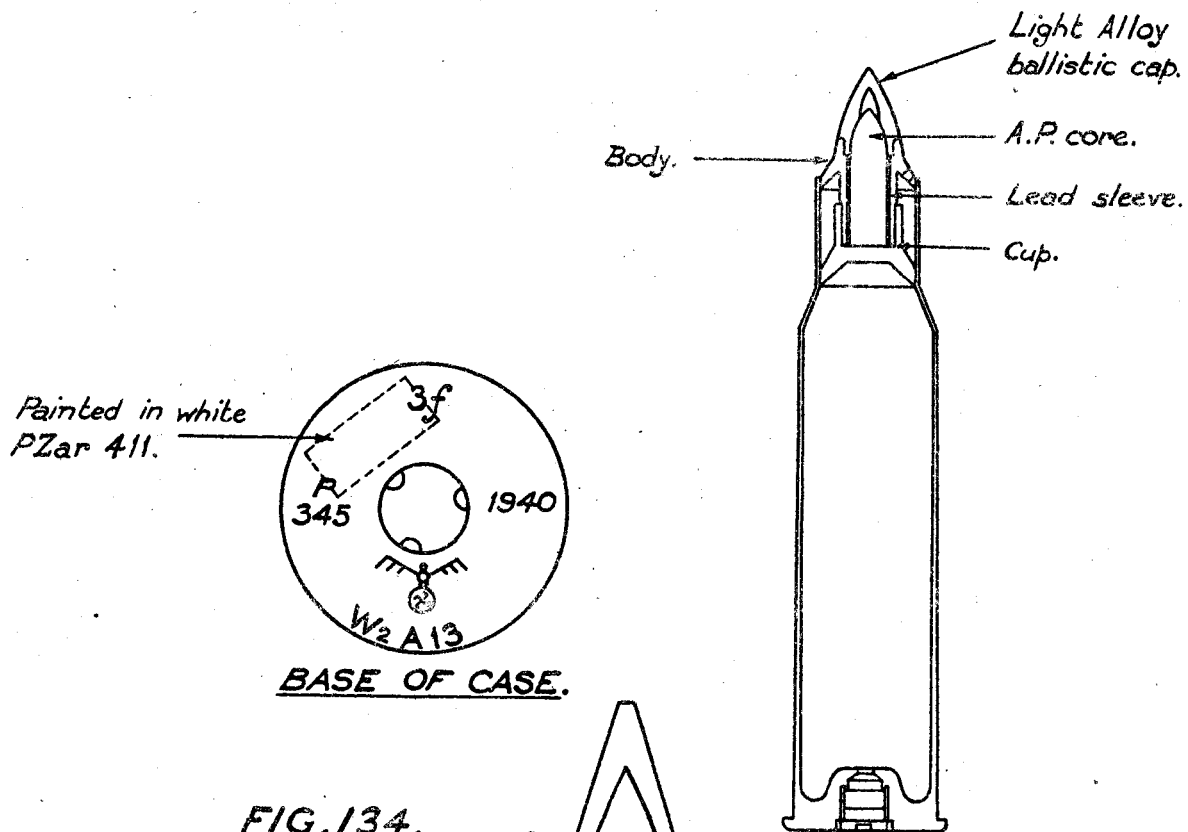


FIG. 135.

GERMAN BASE FUZE.

